December 15, 2000

MEMORANDUM

TO: Stephen E. West, Administrator
Boise Regional Office

FROM: Bill Rogers, Air Quality Engineer
State Technical Services Office

THROUGH: Daniel Salgado
Lead Process Engineering
State Technical Services Office

SUBJECT: ***TIER II OPERATING PERMIT TECHNICAL ANALYSIS***
T2000072, Champion Home Builders, Weiser
(Production of Manufactured Homes)

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.400 (*Rules for the Control of Air Pollution in Idaho*) for issuing Tier II Operating Permits.

PROJECT DESCRIPTION

Champion Home Builders has submitted a Tier II Operating Permit (OP) application for an existing facility located at 1442 Sunny Side Road in Weiser, Idaho. The facility produces manufactured homes. Associated emissions include particulate matter (PM), volatile organic compounds (VOC's), and toxic air pollutants (TAP's).

SUMMARY OF EVENTS

On May 2, 2000, the Idaho Department of Environmental Quality (DEQ) received a Tier II OP application from Champion Home Builders (Champion). The application was determined complete on June 2, 2000. As required by IDAPA 58.01.01.404, a proposed permit was made available for public comment from September 20, 2000 through October 20, 2000. No comments were received.

DISCUSSION

1. Process Description

A photocopy of the facility plot plan is provided as Appendix A of this document to help the reader identify the locations of the various processes.

CYCLONE

Sawdust and sanderdust from the Mill and Cabinet Shop are pneumatically conveyed via an enclosed vacuum system to an exteriorly located cyclone. The cyclone has the following stack characteristics:

Stack Height (ft):	20
Stack Diameter (ft):	3.0
Exhaust Flowrate (acfm):	4,200
Exhaust Temperature (°F):	70 (ambient)

MANUFACTURING PLANT

All painting is done within the Manufacturing Plant using airless spray guns. The guns are designed

such that painting is not required within a booth (i.e. there is little overspray). Only water-based, latex paints are used. Emissions from this process include PM (non-toxic paint solids) and TAP's (hazardous ingredients in the form of PM). VOC emissions are negligible. This analysis assumes the paint transfer efficiency is 50%; however, the transfer efficiency is much higher due to the design of the spray paint guns. It is assumed that all of the TAP's and 50% of the non-volatile solids contained in the paint are emitted to the atmosphere from the Manufacturing Plant's four (4) ceiling exhaust vents. Emissions from this process are uncontrolled.

Flooring, wall paneling, and ceiling tiles are installed using adhesives in the Manufacturing Plant. Adhesive emissions are vented to the atmosphere though the Manufacturing Plant's ceiling exhaust vents. Emissions from this process are uncontrolled.

2. Facility Classification

Champion Home Builders is not a major facility as defined in IDAPA 58.01.01.006.55. The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The facility is not subject to any federal New Source Performance Standards (NSPS) in accordance with 40 CFR 60, National Emission Standards for Hazardous Air Pollutants (NESHAP) in accordance with 40 CFR 61, or National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT) in accordance with 40 CFR 63. The Standard Industrial Classification (SIC) code defining this facility is 1521 (General Contractors - Single-Family Houses), and the facility classification is B.

3. Area Classification

Champion Home Builders is located in Weiser, Idaho which is located in southwestern Washington County. Washington County is located in Air Quality Control Region (AQCR) 63 and Zone 11. This area is designated as attainment or unclassifiable for all regulated criteria air pollutants.

4. Emission Estimates

4.1 Cyclone

PM-10 emissions from the mill and cabinet shop were estimated using the flowrate through the cyclone and Idaho DEQ emission factors for the wood products industry. The emission factor chosen is for a medium efficiency cyclone processing mill mix. The emission estimates and emission factor guide is presented as Appendix B of this document.

The results of the emission analysis indicate the potential to emit PM-10 is 0.54 pounds-per-hour (lb/hr) and 2.36 tons-per-year (T/yr), assuming continuous operation of the processes. The potential to emit does not trigger major source permit requirements.

An ambient analysis was also conducted to determine the ambient impact from the cyclone for NAAQS compliance purposes. Using the cyclone's stack parameters listed above, the maximum one-hour impact predicted by the model is 95.93 ug/m3 (at a 1 lb/hr emission rate). Using this maximum, the predicted 24-hour and annual PM-10 impacts from the cyclone are 20.72 ug/m3 and 4.14 ug/m3, respectively. When added to the statewide 24-hour and annual PM-10 background concentrations, the predicted impacts do not cause or contribute to a violation of the NAAQS. The ambient analysis is also presented as Appendix B of this document.

4.2 Painting

Painting is performed within the Manufacturing Plant using airless spray guns. The guns are designed such that painting is not required in a spray paint booth (i.e. there is little overspray). All of the paint used by this facility is water-based latex paint. The VOC content is negligible. The emissions of concern are toxic air pollutants in the form of particulates.

A spreadsheet was developed to estimate PM-10, VOC, and TAP emissions from the painting process. Even though VOC are considered negligible, they were quantified and modeled for emission inventory and NAAQS purposes. PM-10 emissions are the non-volatile solids in the paint. The paint transfer efficiency is conservatively assumed to be 50%. The emissions analysis includes year 1999 paint throughput rates with a twenty percent safety factor added, and product information provided in the Material Safety Data Sheets (MSDS) for each paint product. Per the applicant, production in 1999 was near capacity. The following narrative explains the methodology used in developing the spreadsheet.

The hazardous compounds listed in each MSDS were compared by CAS number to Idaho's non-carcinogenic and carcinogenic toxic air pollutant increments (IDAPA 58.01.01.585 and 586, respectively) to determine those hazardous compounds that are regulated by the state of Idaho as toxic air pollutants when emitted to the atmosphere. Once identified, each TAP was listed in the spreadsheet along with it's CAS number and weight percent as indicated in the MSDS. The weight percent of each TAP was multiplied by the paint density to determine the pounds of each TAP per gallon of paint. Those values were then multiplied by the adjusted annual paint throughput to determine annual TAP emissions. Hourly TAP emissions are simply annual emissions divided by 8,760 hours-per-year of operation. Annual TAP emissions were aggregated and summed to determine if the facility is a major source for hazardous air pollutant emissions in accordance with IDAPA 58.01.01.008.10. As indicated in the spreadsheet, the total TAP emissions are 9.74 T/yr which does not meet the definition of a Title V major facility. In addition to quantifying emissions, an ambient assessment of the TAP's was conducted to demonstrate compliance or non-compliance with IDAPA 58.01.01.585 and 586. The analysis indicates that the predicted impacts are less than the allowable toxic increments. This analysis conservatively assumes that each TAP is emitted to the atmosphere uncontrolled through the Manufacturing Plant's roof vents.

PM-10 emissions for each paint were estimated by multiplying the solids volume of the paint by the paint density and the adjusted 1999 throughput rate. The solids volume was determined by subtracting the volatile volume of each paint from one. Again, the paint transfer efficiency, in terms of the paint solids is assumed to be 50%. The volatile volume is the amount of water and solvents contained in the paint. Per the paint manufacturer, the amount of solvent, propylene glycol, a non-regulated compound, is less than two percent. The volatile volumes were obtained from the MSDS'. VOC emissions were estimated by multiplying the theoretical VOC content (lb/gal) by the adjusted 1999 throughput rate. The emission estimates assume continuous operation. The spreadsheet and MSDS' are presented as Appendix C of this document. Referring to Appendix C, emissions from the painting process do not trigger major source permitting requirements and their associated ambient impacts demonstrate compliance with all applicable ambient standards.

4.3 Adhesives

Adhesives are used to install subflooring, flooring, wall paneling, and ceiling tile. The

applicant supplied MSDS' for the adhesives that are used. Emissions were estimated based on the information contained in the MSDS'. Subflooring, flooring, and wall paneling are installed using a urethane adhesive manufactured by Henkel Adhesives. Ceiling tiles are installed using a two-part adhesive manufactured by Foam Supplies, Inc. One part , FoamNail Part A, is the adhesive and the other part, FoamNail Part B, is the catalyst. Both are sprayed onto a ceiling rafter simultaneously though a gun having a dual nozzle. The only hazardous ingredient contained in the adhesives is methylenediphenyl diisocyanate (MDI). However, due to it's low vapor pressure (<0.0001 mmHg @ 20C), MDI emissions are insignificant.

MDI emissions from the ceiling adhesive were estimated for the applicant by The Society of the Plastics Industry, Inc. Only FoamNail Part A contains MDI. Based on maximum production, annual MDI emissions are estimated to be 0.035 lb/yr. This value however assumes 250 days per year of operation. Because there is no enforceable limit on operations, the potential to emit has to be based on 365 days per year of operation, not 250 days per year. Therefore, the correct emission estimate should be: (0.035 lb/yr)(365/250) = 0.05 lb/yr. This equates to 5.71E-06 lb/hr assuming 8,760 hr/yr of operation. MDI emissions from the flooring/wall paneling adhesive were estimated using the annual ceiling adhesive emission rate times the ratio of flooring/wall paneling adhesive usage and ceiling tile adhesive usage. Flooring/wall paneling MDI emissions are estimated at 3.28E-06 lb/hr and 0.03 lb/yr. Combined MDI emissions from both adhesives is 7.20E-06 lb/hr and 0.062 lb/yr. The MDI emission estimates and adhesive MSDS' are presented as Appendix C of this document.

Per IDAPA 58.01.01.585, the EL for MDI is 0.003 lb/hr. The emission estimate of 7.20E-06 lb/hr is three orders of magnitude less than the EL. Therefore, a limit on the potential to emit for this process is not required.

5. Modeling

Modeling of criteria and toxic air pollutant emissions was accomplished using the EPA approved SCREEN3 modeling program. Based on the modeled results, the predicted criteria air pollutant impacts from this facility do not cause or contribute to a violation of the NAAQS. Likewise, predicted TAP impacts are less than all respective allowable toxic ambient increments. Hard copies of the modeling output files are located with the appendicy of each respective process.

6. Regulatory Review

The following is an explanation of the applicable air quality rules and regulations for the proposed project.

6.1 IDAPA 58.01.01.401 Tier II Operating Permit

The facility is an existing facility which requires a Tier II Operating Permit in accordance with IDAPA 58.01.01.401.01.

6.2 IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

PM-10 and VOC emissions from the facility have been modeled and have been found to demonstrate compliance with the NAAQS.

6.3 IDAPA 58.01.01.585 & 586 Non-Carcinogenic and Carcinogenic Toxic Air Pollutant Standards

TAP emissions have been estimated and modeled for the painting and adhesive processes. All TAP's are shown to demonstrate compliance with their allowable toxic increments.

7. Permit Requirements

The following Section outlines each Tier II OP requirement and the regulatory/technical basis.

7.1 Facility-Wide Conditions

7.1.1 Emission Limits

All stacks, vents, and other openings at this facility must comply with the opacity rules contained in IDAPA 58.01.01.625.

7.1.2 Operating Requirements

The facility is required to reasonably control fugitive emissions per IDAPA 58.01.01.651.

The facility is required to control their emissions of odorous gases per IDAPA 58.01.01.776.

7.1.3 Monitoring Requirements

The facility is required to maintain fugitive dust and odor logs of all complaints received. Corrective action is required within 24-hours of each valid complaint.

7.2 Mill and Cabinet Shop Cyclone

7.2.1 Opacity Limit

The Mill and Cabinet Shop cyclone must comply with the opacity rules contained in IDAPA 58.01.01.625.

7.3 Manufacturing Plant

7.3.1 Paint Products

The Permittee is not allowed to use any paint product with VOC contents or HAP contents greater than those listed in the MSDS's submitted in their permit application and upon which this analysis is based. Different paint manufacturers product can be used so long as the products adhere to the above limit.

7.3.2 Adhesive Products

Same as Condition 7.5.1.

8. Permit Coordination

A draft copy of the Tier II OP and technical analysis will be made available for public comment in accordance with IDAPA 16.01.01.404.01.c.

9. AIRS Information

Information necessary to the AIRS database is included as Appendix D of this Technical Memorandum.

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470. The facility is subject to permit application fees of $500 for this Tier II OP.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommends that Champion Home Builders be issued proposed Tier II Operating Permit No. 087-00008 for their manufactured home production facility located in Weiser, Idaho. A public comment period is required in accordance with IDAPA 58.01.01.404.01.c.

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cc: DEQ State Office
Boise RO

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706-2239 • (208) 373-0550

Dirk Kempthorne, Governor
C. Stephen Allred, Director

December 19, 2000

MEMORANDUM

TO: Dave Sande, Accountant Supervisor
Support Services

FROM: Bill Rogers, Air Quality Engineer
DEQ State Office

SUBJECT: Permit Application Fees for Tier II Permit

The following facility has been reviewed for compliance with IDAPA 16.01.01.470 "Permit Application Fees for Tier II Permits":

Champion Home Builders - Weiser, Idaho

Champion Homes Builders facility in Weiser, Idaho, has applied for a Final Tier II Operating Permit (#087-00008) for the sources that exist at the facility. DEQ will not release the facility's Tier II Operating Permit until receipt of permit application fees. According to IDAPA 16.01.01.470, the facility is subject to permit application fees for Tier II Permits of:

Five Hundred Dollars and No Cents ($500.00)

The contact and mailing address for the above facility is:

PERSON CONTACT: Mr. Tom Spurling, Safety Coordinator
COMPANY ADDRESS: 1442 Sunnyside Road
Weiser, Idaho 83672

DS\BR:hs:cm H:\CHAMPION.WPD

cc: DEQ Boise Regional Office
Source File
COF

RECEIVED
DEC 22 2000
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A.Q. PROGRAM

APPENDIX A

Facility Plot Plan

Champion Home Builders
Weiser

T200072
September 2000

Cyclone:
Stack ht = 20'
Stack dia = 3'
Flowrate = 4200 acfm
Temp = Ambient
DUST CYCLONE SCREEN3 = 95.93 ug/m³
(See ATTACHMENT C)

SAW DUST BEND

51'6"

FAN

INDICATES:
CEILING VENTILATION FAN
(APPROX. LOCATION)
(NOT TO SCALE)

Note: ROOF VENTS —
Roof ht = 27'
vent dia = 3.5'
Concrete = 1548 acfm x4
= 6192 acfm
Temp = Ambient
SCREEN3 = 51.37 ug/m³
@ 1¼/hr.

Site Area = ~ 20 ac

constructed 1967.

CHAMPION HOME BUILDERS CO.	MODIFICATIONS: MODIFIED RAIL ROAD DOCK AREA — DEAN H. 12/18/89	DRAWN BY: BRIAN REDFIELD APPROVED BY: SCALE: DATE: JUNE 1 1989	TITLE: CHAMPION HOMES WEBSTER PLANT LAYOUT	D 1.16

APPENDIX B

Mill and Cabinet Shop Cyclone
Emission Estimates and Ambient Analysis

Champion Home Builders
Weiser

T200072
September 2000

T20072 | Champion Home Builders

Cyclone Emission:

From mill and cabinet shop —

Flowrate = 4200 cfm.

Actual cond = Standard cond.

↳ change in stack pressure is negligible.

∴ DEQ Emission Factors for the Wood Dusts and

→ Cyclone Exhaust —

Mill Mix = Med efficiency

0.015 gr/scf ⇒ PM-10.

$(4200\ scf/min)(0.015\ gr/scf)(60\ min/hr)(1\ lb/7000\ gr)$

$= 0.54\ lb/hr.$

@ 8760 hr/yr = 2.36 T PM-10/yr.

Ambient Analysis: PM-10 Only

SCREEN3 1-hr Max Conc. = 95.93 $\mu g/m^3$ @ 1 lb/hr.

$(0.54\ lb/hr)(95.93\ \mu g/m^3/lb.hr)(0.4) = 20.72\ \mu g/m^3$ 24-hr Ave

State-wide 24-hr Background = 86 $\mu g/m^3$

Total Impact = $(20.72 + 86)\ \mu g/m^3 = 106.72\ \mu g/m^3$

NAAQS = 150 $\mu g/m^3$.

$(0.54\ lb/hr)(95.93\ \mu g/m^3/lb.hr)(0.08) = 4.14\ \mu g/m^3$ Annual Ave

Statewide annual background = 32.7 $\mu g/m^3$

Total Impact = $(4.14 + 32.7)\ \mu g/m^3 = 36.84\ \mu g/m^3$

NAAQS = 50 $\mu g/m^3$

TOPS

T200072

CHAMPION HOME BUILDERS

1442 Sunnyside Road, Weiser, Idaho

EMISSIONS ANALYSIS

PAINT PRODUCTS

PAINT PRODUCT	TAP's	CAS	TAP WEIGHT	PAINT	TAP	MAX. PAINT	TAP	TAP	SOLIDS	SOLIDS	PM-10	PM-10	VOC	VOC	VOC
B17W496		NUMBER	PERCENT	DENSITY	QUANTITY	THROUGHPUT	EMISSIONS	EMISSIONS	VOLUME	QUANTITY	EMISSIONS	EMISSIONS	VOLUME	EMISSIONS	EMISSIONS
LOW TEMP35			% by wt.	lb/gal	lb/gal	gal/yr	lb/hr	T/yr	%	lb/gal	lb/hr	T/yr	lb/gal	lb/hr	T/yr
	cristobalite	14464-46-1	0.4	9.95	0.04	12168	0.06	0.24							
	kaolin	1332-58-7	3	9.95	0.30	12168	0.41	1.82	34	3.38	2.35	10.29	0.84	1.17	5.11
	zinc oxide	1314-13-2	3	9.95	0.30	12168	0.41	1.82							
					1999 throughput	10140		3.87				10.29			5.11
PAINT PRODUCT	TAP's	CAS	TAP WEIGHT	PAINT	TAP	MAX. PAINT	TAP	TAP	SOLIDS	SOLIDS	PM-10	PM-10	VOC	VOC	VOC
B20WF520		NUMBER	PERCENT	DENSITY	QUANTITY	THROUGHPUT	EMISSIONS	EMISSIONS	VOLUME	QUANTITY	EMISSIONS	EMISSIONS	VOLUME	EMISSIONS	EMISSIONS
Contractor Satin			% by wt.	lb/gal	lb/gal	gal/yr	lb/hr	T/yr	%	lb/gal	lb/hr	T/yr	lb/gal	lb/hr	T/yr
	cristobalite	14464-46-1	0.1	10.45	0.01	14784	0.0176	0.08							
	kaolin	1332-58-7	5	10.45	0.52	14784	0.8818	3.86	41	4.28	3.62	15.84	0.95	1.60	7.02
	mica	12001-26-2	2	10.45	0.21	14784	0.3527	1.54							
					1999 throughput	12320		5.48				15.84			7.02
PAINT PRODUCT	TAP's	CAS	TAP WEIGHT	PAINT	TAP	MAX. PAINT	TAP	TAP	SOLIDS	SOLIDS	PM-10	PM-10	VOC	VOC	VOC
B72WF200		NUMBER	PERCENT	DENSITY	QUANTITY	THROUGHPUT	EMISSIONS	EMISSIONS	VOLUME	QUANTITY	EMISSIONS	EMISSIONS	VOLUME	EMISSIONS	EMISSIONS
Vapor Barrier Primer			% by wt.	lb/gal	lb/gal	gal/yr	lb/hr	T/yr	%	lb/gal	lb/hr	T/yr	lb/gal	lb/hr	T/yr
	mica	12001-26-2	2	9.91	0.20	3894	0.09	0.39	29	2.87	0.64	2.80	0.70	0.31	1.36
					1999 throughput	3245		0.39				2.80			1.36

ADHESIVES

ADHESIVE	TAP's	CAS	TAP WEIGHT	PAINT	TAP	MAXIMUM	TAP	TAP
HENKEL		NUMBER	PERCENT	DENSITY	QUANTITY	THROUGHPUT	EMISSIONS	EMISSIONS
URETHANE			% by wt.	lb/gal	lb/gal	gal/yr	lb/hr	T/yr
	MDI	101-68-8	30	9.13	2.739	1584	3.28E-06	1.44E-05
					1999 throughput	1320		1.44E-05

ADHESIVE	TAP's	CAS	TAP WEIGHT	PAINT	TAP	MAXIMUM	TAP	TAP
FOAM SUPPLIES		NUMBER	PERCENT	DENSITY	QUANTITY	THROUGHPUT	EMISSIONS	EMISSIONS
FOAM NAIL A			% by wt.	lb/gal	lb/gal	gal/yr	lb/hr	T/yr
	MDI	101-68-8	45	10.29	4.6305	1838.3673	5.71E-06	2.50E-05
					1999 throughput	15764	lb/yr	2.50E-05

Note: MAXIMUM THROUGHPUT = 1999 throughput X 1.2

TAP = TOXIC AIR POLLUTANT

Paint PM-10 transfer efficiency is 50%

TOTAL TAP's	
T/yr	9.74

TOTAL PM-10	
T/yr	28.92

TOTAL VOC's	
T/yr	13.50

AMBIENT ANALYSIS

TAP's	CAS NUMBER	TAP EMISSIONS lb/hr	EL lb/hr	TAP's>EL? Y or N	SCREEN3 1-HR IMPACT ug/m3	PREDICTED 24-HR IMPACT mg/m3	AMBIENT LIMIT (AAC) mg/m3	TAP's>AAC? Y or N
cristobalite	14464-46-1	0.0729	0.0033	Y	51.37	0.0015	0.0025	N
kaolin	1332-58-7	1.2964	0.133	Y	51.37	0.0266	0.1	N
mica	12001-26-2	0.4408	0.2	Y	51.37	0.0091	0.15	N
zinc oxide	1314-13-2	0.4146	0.667	N	51.37	0.0085	0.5	N
MDI	101-68-8	8.99E-06	0.003	N	51.37	1.8465E-07	0.0025	N

AMBIENT ANALYSIS

CRITERIA AIR POLLUTANTS	PM-10 EMISSIONS lb/hr	SCREEN3 1-HR IMPACT ug/m3	PREDICTED 24-HR IMPACT ug/m3	PREDICTED ANNUAL ug/m3	NAAQS 24-HR IMPACT ug/m3	NAAQS ANNUAL ug/m3
PM-10	6.60	51.37	135.69	27.14	150	50

	VOC EMISSIONS lb/hr	SCREEN3 1-HR IMPACT ug/m3	PREDICTED 1-HR ug/m3	NAAQS 1-HR as O3 ug/m3
VOC	3.08	51.37	158.26	235

8/30/00 0

2:20:08 1

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

200072 - Champion Home Builders - Cyclone

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	6.0960
STK INSIDE DIAM (M)	=	.9144
STK EXIT VELOCITY (M/S)	=	3.0185
STK GAS EXIT TEMP (K)	=	294.2611
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .023 M**4/S**3; MOM. FLUX = 1.897 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.2208E-01	2	5.0	5.0	1600.0	6.11	2.35	1.26	NO

	100.	90.78	4	4.0	4.0	1280.0	6.80	8.22	4.6
9	NO								
	200.	80.16	4	1.5	1.5	480.0	11.62	15.64	8.6
4	NO								
	300.	72.49	4	1.0	1.0	320.0	14.38	22.73	12.3
2	NO								
	400.	74.13	6	1.0	1.0	10000.0	13.15	14.77	7.3
3	NO								
	500.	80.59	6	1.0	1.0	10000.0	13.15	18.08	8.6
3	NO								
	600.	78.58	6	1.0	1.0	10000.0	13.15	21.33	9.8
9	NO								
	700.	73.04	6	1.0	1.0	10000.0	13.15	24.54	11.1
1	NO								
	800.	66.33	6	1.0	1.0	10000.0	13.15	27.71	12.1
4	NO								
	900.	59.99	6	1.0	1.0	10000.0	13.15	30.84	13.1
4	NO								
	1000.	54.25	6	1.0	1.0	10000.0	13.15	33.94	14.1
0	NO								

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

	58.	95.93	3	4.0	4.0	1280.0	6.80	7.67	4.6
3	NO								

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	95.93	58.	0.

Process Equipment	Description	Units	Pounds Pollutant Per Unit Product PM	PM-10	SOx	NOx	CO	VOC	PM/PM-10 Act. Factor	For Condition	Reference
Dryers: Wood-fired	Dutch Oven/Fuel cell	1000 lb Stm	0.40	0.20	0.014	0.31	3.0	0.13	–	–	1
		Tons burned			0.075	0.28	6.5<>	0.18			5
	Sonneder-Stoker	1000 lb Stm	0.40	0.20	0.014	0.31	2.0	0.13	–	–	1
		Tons burned			0.075	1.5	10.5<>	0.22			5
	Fluidized bed	1000 lb Stm	0.40	0.20	0.014	0.31	1.0	0.13	–	–	1
		Tons burned			0.075	2.0	1.4	NO			5
Wood-fired	Uncontrolled	Tons burned	8.8	4.4							5
	w/o flyash reinjection		4.2	2.6							5
	With electrostatic precip.		0.17	0.17							5
Bark-fired	Uncontrolled	Tons burned	47	17							5
	with flyash reinjection		14	11							5
	w/o flyash reinjection		9.0	3.2							5
	With wet scrubber		2.9	2.3							5
Wood/bark-fired	Uncontrolled	Tons burned	7.2	6.5							5
	with flyash reinjection		6.0	5.5							5
	w/o flyash reinjection		5.3	1.7							5
	With wet scrubber		0.48	0.47							5
	With electrostatic precip.	Tons burned	0.04	0.04							5
Veneer Dryer-Gas Heat	Doug Fir (Uncontr)	1000 sq. ft. on	0.52	0.52	–	0.12	0.02	0.22	–	–	3
	(Burley or 45% Ctr)	3/8 Basis	0.29	0.29	–	0.12	0.02	0.22	–	–	3
	Hemlk/Wt Fir (Uncr)		0.15	0.15	–	0.12	0.02	0.22	–	–	3
	(Burley or 45% Ctr)		0.10	0.10	–	0.12	0.02	0.22	–	–	3
Stm Heat	Doug Fir (Uncontr)	1000 sq. ft. on	1.01	1.01	–	–	–	0.24	–	–	3
	(Burley or 45% Ctr)	3/8 Basis	0.56	0.56	–	–	–	0.24	–	–	3
	Hemlk/Wt Fir (Uncr)		0.25	0.25	–	–	–	0.24	–	–	3
	(Burley or 45% Ctr)		0.15	0.15	–	–	–	0.24	–	–	3
Wood Fired	All Species (<20% moist. in heat fuel)	1000 sq. ft. on 3/8 Basis	0.75	0.38	–	0.4	1.4	0.2	–	–	3
	(> 20% moisture in heat unit fuel)		1.50	0.75	–	0.4	1.4	0.2	–	–	3
Plywood/Particleboard	General, not classfd	10000 sq. ft. of of 3/8" board	4.25	2.47	–	–	–	1.52	–	–	1,2
Drying:	Fir/ Sapwd/Stm Frd	10000 sq. ft. of	4.64	2.69	0	–	–	3.45	–	–	1,2
	Fir/Sapwd/Gas Frd	of 3/8" board	2.37	1.37	0	–	–	7.53	–	–	1,2
	Fir/Hrdwd/Ply Venr		3.18	1.84	0	–	–	1.3	–	–	1,2
	Larch Plywd Veneer		4.14	2.4	0	–	–	0.19	–	–	1,2
	Sout Pine Ply Venr		3.7	2.15	0	–	–	2.34	–	–	1,2
	Particleboard	Tons Processd	0.6	0.35	0	0	0	0	–	–	1,2
	Coe: Hardboard	T Dry Product	–	–	0	0.3	–	1.0	–	–	1,2
	Waterboard	10M lb Dried	359.0	498.0	17.0	114.0	–	409.0	–	–	1,2
Hardboard:	Pressing	T Dry Product	–	–	0	0	–	1.45	–	–	1,2
	Tempering		–	–	0	0	–	0	–	–	1,2
	Bake oven		–	–	0	0.1	–	0.003	–	–	1,2
	Predryer	T Dry product	–	–	0	0.3	–	1.0	–	–	1,2
Log Debarking	Uncontrolled Emis.	Tons of logs	0.024	0.011	–	–	–	–	–	–	1,2
Sawing Logs	Uncontrolled Emis.	Tons of Logs	0.35	0.2	–	–	–	–	0.4-1.0**	55-25% H20 in log	1,2
Sawdust Pile	Uncontrolled Emis.	Tons Handled	1.0	0.38	–	–	–	–	0.4-1.0	50-25% H20 in pile	1,2
Lumber Drying Kilns	Uncontrolled Emis.	M Board Feet	0.33	0.19	–	–	–	1.50	–	–	1,4
Cyclone Exhaust	Dry & Green Chips,	Bonedry Tons	0.5	0.25 (both for Medium Efficiency)*				–	–	–	3
	Shavings, Hogged		0.2	0.16 (both for High Efficiency)*				–	–	–	3
	Fuel/Bark, Green	Bonedry Tons	0.001	0.001(with Bagnouse)				–	–	–	3
	Sawdust,										
	Mill Mix	(grains/scf Air)	0.02	0.015 (both for Medium Efficiency)*				–	0.4-1.0***	50-25% H20 in Mix	2
	Mill Mix	(grains/scf Air)	0.015	0.011 (both for High Efficiency)*				–	0.4-1.0***	50-25% H20 in Mix	2
	Mill Mix	(grains/scf Air)	0.0001	0.0001 (with Bagnouse)				–	0.4-1.0***	50-25% H20 in Mix	2
Cyclone Exhaust	Sanderdust	Bonedry Tons	2.0	1.6 (both for High Efficiency)*				–	–	–	3
	Sanderdust	Bonedry Tons	0.04	0.04 (with Bagnouse)				–	–	–	3
	Sanderdust	(grains/scf Air)	0.055	0.028 (both for Medium Efficiency)*				–	0.55-1.0***	50-25% H20 in Mix	2
	Sanderdust	(grains/scf Air)	0.025	0.02 (both for High Efficiency)*				–	0.55-1.0***	50-25% H20 in Mix	
	Sanderdust	(grains/scf Air)	0.0001	0.0001 (with Bagnouse)				–	0.55-1.0***	50-25% H20 in Mix	
Target Box	Medium Efficiency	Bonedry Tons	0.1	0.05	–	–	–	–	–	–	3
Waste Wood	Bin Venting	Tons Handled	1.0	0.58	–	–	–	–	0.4-1.0	50-25% H2O content	1,2
	Bin Unloading	Tons Handled	2.0	1.2	–	–	–	–	0.4-1.0	50-25% H2O content	1,2

1. EPA 450/4-90-003, March 1990, "AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants."
2. AP-42, dated February 1980.
3. Oregon DEQ/AQ Permitting and Inspection Manual, November 1993.
4. Gullian, R. and Washington, E., ET Report 1/20 and 1/25/92 by Environmental Measurement, Flagstaff, AZ, 1992.
5. AP-42, dated January 1995.

* Efficiency range determined per C. E. Lapple equations (Air Pollution Control by C. D. Cooper and F. C. Alley; Chapter 4).
** Consider also whether operation is inside and how well enclosed.
*** Mill Mix is less dry and more coarse than Sander Dust.
<> Both came from same source and overlapped ranges. Use the lower number for both if good operation of boiler.

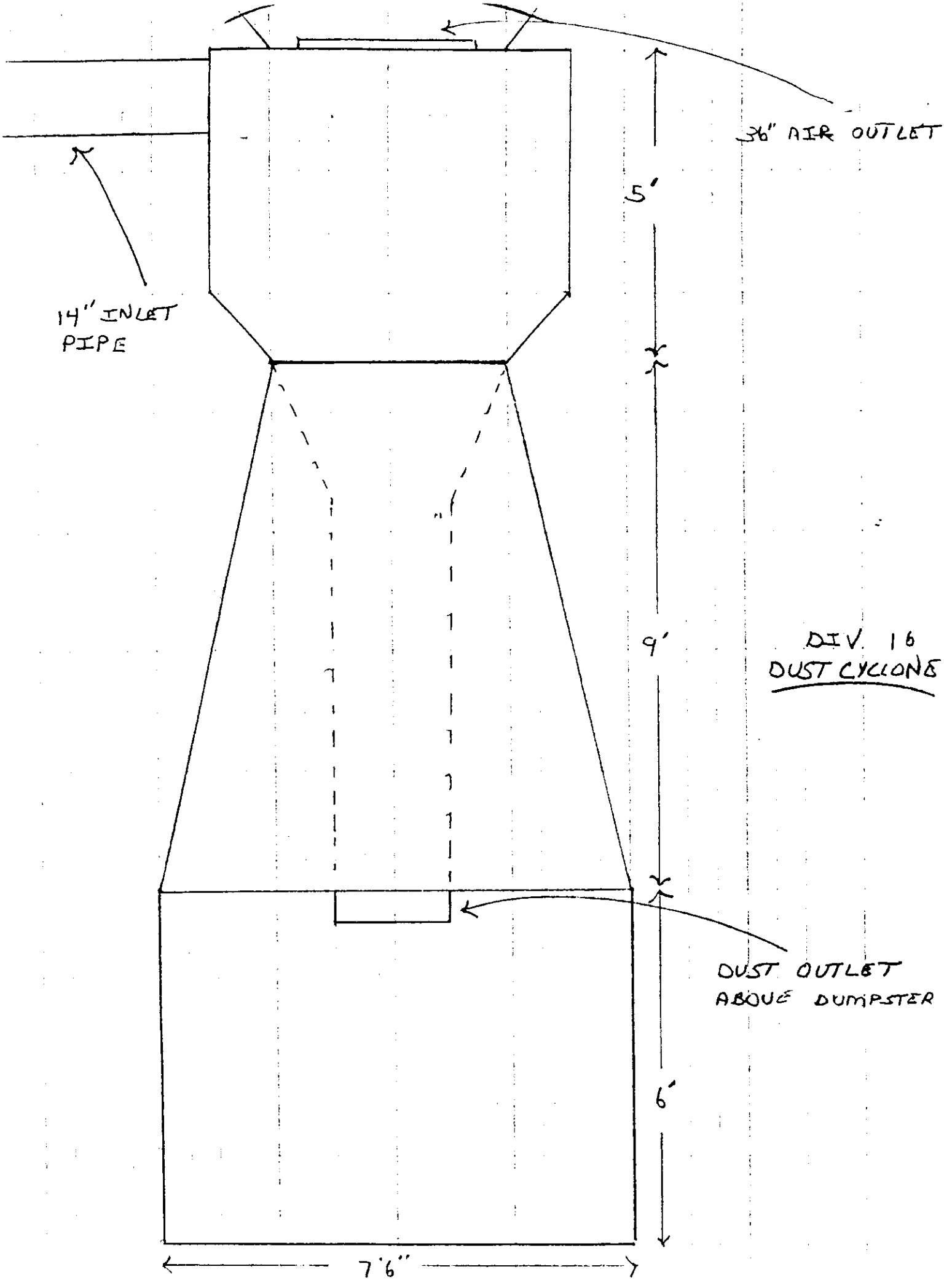
KAMAN

20 HP RADIAL DIRECT DRIVE BLOWER (ARCHER BRAND)
APROX. 4200 CFM

CYCLONE IS 51'6" FROM NORTH WALL OF BUILDING

ATTACHMENT C

215 S.E. 3rd Street, Ontario, OR 97914
Tel: (541) 889-9143 • Fax: (541) 889-4342


36" AIR OUTLET
5'
14" INLET PIPE
9'
DIV. 16
DUST CYCLONE
DUST OUTLET
ABOVE DUMPSTER
6'
7'6"

APPENDIX C

Painting and Adhesive Product
Emission Estimates and Ambient Analysis

Champion Home Builders
Weiser

T200072
September 2000

0

8/30/00

1

2:18:47
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

200072 - Champion Home Builders - Manufacturing Plant Ceiling Vents

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	8.2296
STK INSIDE DIAM (M)	=	1.0668
STK EXIT VELOCITY (M/S)	=	3.2588
STK GAS EXIT TEMP (K)	=	294.2611
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .034 M**4/S**3; MOM. FLUX = 3.010 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.1802E-05	1	3.0	3.0	960.0	10.82	3.40	1.67	NO

	100.	50.39	3	3.0	3.0	960.0	10.82	12.50	7.5
1	NO	-							
	200.	50.39	3	1.0	1.0	320.0	18.66	23.81	14.3
4	NO								
	300.	45.97	4	1.0	1.0	320.0	18.66	22.81	12.4
5	NO								
	400.	44.81	5	1.0	1.0	10000.0	17.89	22.18	11.1
6	NO								
	500.	44.54	6	1.0	1.0	10000.0	16.25	18.11	8.7
0	NO								
	600.	49.78	6	1.0	1.0	10000.0	16.25	21.36	9.9
5	NO								
	700.	50.74	6	1.0	1.0	10000.0	16.25	24.56	11.1
7	NO								
	800.	48.82	6	1.0	1.0	10000.0	16.25	27.73	12.1
9	NO								
	900.	46.13	6	1.0	1.0	10000.0	16.25	30.86	13.1
8	NO								
	1000.	43.16	6	1.0	1.0	10000.0	16.25	33.96	14.1
4	NO								

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

	145.	51.37	3	1.5	1.5	480.0	15.18	17.79	10.7
1	NO								

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	51.37	145.	0.

SHERWIN WILLIAMS

MID WESTERN DIVISION
INTER-COMPANY CORRESPONDENCE

RECEIVERS LOCATION AND DEPARTMENT

DATE
January 25, 1999

TO (INDIVIDUALS NAME)
Mark Elliott

SENDERS LOCATION, DEPARTMENT, AND TELEPHONE NUMBER
Mid Western Div - Strongsville, OH

REFER TO LETTER OF

SUBJECT
CHAMPION HOMES REQUEST FOR ETHYLENE GYCOL FREE PRODUCTS

Per your request, our product development lab has investigated the use of Ethylene Glycol in products you sell to Champion Homes. The good news is that none of their products contain Ethylene Glycol, but rather Propylene Gycol, which is free of any HAPS issues.

Following is the list of products we discussed. I trust this is sufficient to resolve their concerns.

Ethylene Glycol Free Products used by Champion Homes

1. Low Temp 35 Satin -- B17 Series

2. Contractor Satin -- B20WF520 Series

3. Vapor Barrier Primer -- B72WF200

If I can be of further assistance, please contact me at 440-846-4317.

Sincerely,

Jon Foerster
Wholesale Marketing Director

JF:rh

cc: D. Olin
T. Braach
D. Karwacki
L. Audette
J. Collins
B. Clark
Spokane File
Modular Home File

ENCLOSURE # 2

MATERIAL SAFETY DATA SHEET

B17W496
04 00

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
16-FEB-00

INFORMATION TELEPHONE NO.
(216) 566-2902

Section I -- PRODUCT IDENTIFICATION

PRODUCT NUMBER

B17W496

HMIS CODES

Health	1*
Flammability	0
Reactivity	0

PRODUCT NAME
LOWTEMP 35* Exterior Latex Satin Finish, Tinting White
PRODUCT CLASS
Latex Paint

Section II -- HAZARDOUS INGREDIENTS

INGREDIENT / CAS No.	% by WT	ACGIH TLV	OSHA PEL	UNITS	V.P.
Cristobalite 14464-46-1	0.4	0.05	0.05	MG/M3 as Resp. Dust	
Kaolin 1332-58-7	3	2	5	MG/M3 as Resp. Dust	
Titanium Dioxide. Not Regulated 13463-67-7	13	10	10(5)	MG/M3 as Dust *** *** Total Dust (Respirable Fraction)	
Zinc Oxide 1314-13-2	3	10	10(5)	MG/M3 as Dust *** *** Total Dust (Respirable Fraction)	

pH - 9.5

Section III -- PHYSICAL DATA

PRODUCT WEIGHT -- 9.95 lb./gal. EVAPORATION RATE -- Slower than Ether
SPECIFIC GRAVITY -- 1.20 VAPOR DENSITY -- Heavier than Air > 1
BOILING POINT -- 212-477 F MELTING POINT -- N.A.
VOLATILE VOLUME -- 66 % SOLUBILITY IN WATER -- N.A.
VOC (Theoretical) -- 0.84 lb/gal 101 gm. (less Federally Exempt Solvents)

2% propylene glicol

H_2O + VOC < 1%

Section IV -- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

FLAMMABILITY CLASSIFICATION
Not Applicable
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

Continued on page 2

B17W496 Low Temp 35 page 2

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V -- HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and upper respiratory system. In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED:	If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN:	Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES:	Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED:	Get medical attention.

CHRONIC Health Hazards

Crystalline Silica (Quartz, Cristobalite) is listed by IARC [illegible]. Long term exposure to high levels of silica dust, which can occur only when sanding or abrading the dry film, may cause lung damage (silicosis) and possibly cancer.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Section VI -- REACTIVITY DATA

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section VII -- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

Continued on page 3

B17W496 Low Temp 35

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII -- PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), 3 mg./m3 (respirable fraction), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section IX -- PRECAUTIONS

DOL STORAGE CATEGORY

Not Applicable

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Section X -- OTHER REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
	Zinc Compound.	2	2.0

CALIFORNIA PROPOSITION 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

B17W496 Lo W Temp 35 page 4

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

B20WF520
01 00

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
16-FEB-00

INFORMATION TELEPHONE NO.
(216) 566-2902

Section I -- PRODUCT IDENTIFICATION

PRODUCT NUMBER

B20WF520

HMIS CODES

Health	1*
Flammability	0
Reactivity	0

PRODUCT NAME
Contractor's Satin Interior Latex Finish, White
PRODUCT CLASS
Latex Paint

Section II -- HAZARDOUS INGREDIENTS

INGREDIENT / CAS No.	% by WT	ACGIH TLV	OSHA PEL	UNITS	V.P.
Cristobalite 14464-46-1	0.1	0.05	0.05	MG/M3 as Resp. Dust	
Kaolin 1332-58-7	5	2	5	MG/M3 as Resp. Dust	
Mica 12001-26-2	2	3	3	MG/M3 as Resp. Dust	
Titanium Dioxide. Not Regulated 13463-67-7 pH - 9.5	13	10	10(5)	MG/M3 as Dust ***	

*** Total Dust (Respirable Fraction)

Section III -- PHYSICAL DATA

PRODUCT WEIGHT -- 10.45 lb./gal.
SPECIFIC GRAVITY -- 1.26
BOILING POINT -- 212-369 F
VOLATILE VOLUME -- 59 %
VOC (Theoretical) -- 0.95 lb/gal

EVAPORATION RATE -- Slower than Ether
VAPOR DENSITY -- Heavier than Air
MELTING POINT -- N.A.
SOLUBILITY IN WATER -- N.A.
114 gm. (less Federally Exempt Solvents)

Section IV -- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

FLAMMABILITY CLASSIFICATION
Not Applicable
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V -- HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and upper respiratory system. In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED:	If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN:	Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES:	Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED:	Get medical attention.

CHRONIC Health Hazards:

Crystalline Silica (Quartz, Cristobalite) is listed by IARC and NTP. Long term exposure to high levels of silica dust, which can occur only when sanding or abrading the dry film, may cause lung damage (silicosis) and possibly cancer.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Section VI -- REACTIVITY DATA

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section VII -- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

Continued on page 3

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII -- PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), 3 mg./m3 (respirable fraction), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section IX -- PRECAUTIONS

DOL STORAGE CATEGORY

Not Applicable

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Section X -- OTHER REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element

No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification.

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

872WF200
02 00

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
16-FEB-00

INFORMATION TELEPHONE NO.
(216) 566-2902

Section I -- PRODUCT IDENTIFICATION

PRODUCT NUMBER

872WF200

HMIS CODES

Health	1*
Flammability	0
Reactivity	0

PRODUCT NAME
PROMAR* Moisture Vapor Barrier
PRODUCT CLASS
Latex Paint

Section II -- HAZARDOUS INGREDIENTS

INGREDIENT / CAS No.	% by WT	ACGIH TLV	OSHA PEL	UNITS	V.P.
Mica 12001-26-2	3	3		3 MG/M3 as Resp. Dust	
Calcium Carbonate. 471-34-1	5	10	15(5)	MG/M3 as Dust *** *** Total Dust (Respirable Fraction)	
Titanium Dioxide. 13463-67-7	8	10	10(5)	MG/M3 as Dust *** *** Total Dust (Respirable Fraction)	
pH - 9.0					

not regulated

Section III -- PHYSICAL DATA

PRODUCT WEIGHT -- 9.91 lb./gal. EVAPORATION RATE -- Slower than Ether
SPECIFIC GRAVITY -- 1.19 VAPOR DENSITY -- Heavier than Air
BOILING POINT -- 212-369 F MELTING POINT -- N.A.
VOLATILE VOLUME -- 71 % SOLUBILITY IN WATER -- N.A.
VOC (Theoretical) -- 0.70 lb/gal 84 gm. (less Federally Exempt Solvents)

Section IV -- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

FLAMMABILITY CLASSIFICATION
Not Applicable
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

Continued on page 2

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion exposed to extreme heat.

Section V -- HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and upper respiratory system. In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED:	If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN:	Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES:	Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED:	Get medical attention.

CHRONIC Health Hazards

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Section VI -- REACTIVITY DATA

STABILITY -- Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section VII -- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

Continued on page 3

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII -- PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), 3 mg./m3 (respirable fraction), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

When sanding or abracing the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section IX -- PRECAUTIONS

DOL STORAGE CATEGORY

Not Applicable

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Section X -- OTHER REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element

No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification.

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

1 tote = 320 gal

$8 Totes

1 c/H

HENKEL ADHESIVES CORP/EL
740 TOLLGATE ROAD
ELGIN IL 60123
847-931-9980

HENKEL ADHESIVES
740 TOLLGATE RD
ELGIN IL 60123

INVOICE#:
DATE: 07/31/98
PAGE: 1

24-HOUR EMERGENCY PHONE NO: CHEMTREC, 800/424-9300

MATERIAL SAFETY DATA SHEET

CHEMICAL NAME:
NONE

TRADE NAME: HENKEL# UR-8225BH-S
(5000 LBS. NOT HAZARDOUS

CHEMICAL FAMILY:
URETHANE - floor glue, wall panels - panel adhesive for

FORMULA:
MIXTURE

HAZARD CLASS:

U.N. NUMBER:

PACKING GROUP:

********** HAZARDOUS COMPONENTS **********

NAME: DIPHENYLMETHANE-DIISOCYANATE (MDI)
CAS NUMBER:
101-68-8
% BY WEIGHT:
10-30%
ACGIH TLV: .005 PPM
OSHA PEL: .02 PPM
OSHA STEL: NOT LISTED
COMMENT:

MDI = (9.13 lb/gal)(0.3) = 2.74 lb/gal

********** PHYSICAL PROPERTIES DATA **********

BOILING POINT: DECOMPOSES AT 646 F
SPECIFIC GRAVITY: 1.1 (8.3 lb/gal)(1.1) = 9.13 lb/gal
VAPOR PRESSURE (mm HG AT 20 DEG C): BELOW 0.0004
PERCENT VOLATILE: NEGLIGIBLE
VAPOR DENSITY: (AIR = 1) 8.6
EVAPORATION RATE: NIL
SOLUBILITY IN WATER: REACTS
pH: NOT APPLICABLE
APPEARANCE AND ODOR:
DARK BROWN VISCOUS LIQUID WITH SLIGHT AROMATIC ODOR.

MATERIAL SAFETY DATA SHEET

(HENKEL #: UR-8225BH-S)

********** FIRE AND EXPLOSION HAZARD DATA **********

FLASH POINT & METHOD: & METHOD: > 200 C
(CLEVELAND OPEN CUP)
FLAMMABLE LIMITS: N/A
LEL%: N/A
UEL%: N/A
EXTINGUISHING MEDIA:
DRY CHEMICAL, FOAM, CARBON DIOXIDE, HALON 1211. IF WATER IS USED, USE VERY LARGE QUANTITIES. THE REACTION BETWEEN WATER AND HOT ISOCYANATE MAY BE VIGOROUS.
SPECIAL FIRE FIGHTING PROCEDURES:
SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE AND PROTECTIVE CLOTHING.
UNUSUAL FIRE & EXPLOSION HAZARDS:
WATER CONTAMINATION WILL PRODUCE CARBON DIOXIDE. DO NOT RESEAL CONTAMINATED CONTAINER AS PRESSURE BUILDUP MAY RUPTURE THEM.

********** HEALTH HAZARD INFORMATION **********

THRESHOLD LIMIT VALUE: .02PPM CEILING
PRIMARY ROUTES OF EXPOSURE: SKIN, NOSE, MOUTH, EYES
OTHER EFFECTS OF OVEREXPOSURE: NO OTHER ADVERSE CLINICAL EFFECTS ARE KNOWN TO BE ASSOCIATED WITH EXPOSURES TO THIS MATERIAL.
EYE CONTACT:
THIS MATERIAL WILL PROBABLY IRRITATE HUMAN EYES FOLLOWING CONTACT.
SKIN CONTACT: NO IRRITATION IS LIKELY TO DEVELOP FOLLOWING CONTACT WITH HUMAN SKIN. DERMATITIS AND SKIN SENSITIZATION CAN DEVELOP AFTER REPEATED AND/OR PROLONGED CONTACT.
INHALATION:
NO HARMFUL EFFECTS OCCURED WHEN RATS WERE EXPOSED ACUTELY FOR 6-8 HOURS TO AIR SATURATED WITH VAPORS OF A SIMILAR MATERIAL. HOWEVER, EVIDENCE SUGGEST THAT MDI CAN INDUCE ASTHMA-LIKE RESPIRATORY SENSITIZATION WHICH IS SIMILAR TO TDI SENSITIZATION. VAPORS AND AEROSOLS CAN IRRITATE EYES, NOSE AND RESPIRATORY PASSAGES AND CAN RESULT IN PERMANENT DECREASES IN LUNG FUNCTION.
INGESTION:
THE ACUTE ORAL LD50 IN RATS IS PROBABLY ABOVE 10G/KG. RELATIVE TO OTHER MATERIALS, A SINGLE DOSE OF THIS PRODUCT IS PRACTICALLY NONTOXIC BY INGESTION. IRRITATION OF THE MOUTH, PHARYNX, ESOPHAGUS AND STOMACH CAN DEVELOP FOLLOWING INGESTION.
CHRONIC EFFECTS OF EXPOSURE: AS NOTED ABOVE

********** FIRST AID **********

EYE FIRST AID:
IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES

AND HAVE EYES EXAMINED AND TREATED BY MEDICAL PERSONNEL.
SKIN FIRST AID:
WASH MATERIAL OFF SKIN WITH PLENTY OF SOAP & WATER. IF REDNESS, ITCHING OR BURNING SENSATION DEVELOPS, GET MEDICAL ATTENTION.
INHALATION FIRST AID:
REMOVE VICTIM TO FRESH AIR. IF COUGH OR OTHER RESPIRATORY SYMPTOMS DEVELOP CONSULT MEDICAL PERSONNEL.
INGESTION FIRST AID: GIVE ONE OR TWO GLASSES OF WATER TO DRINK. IF GASTROINTESTINAL SYMPTOMS DEVELOP CONSULT MEDICAL PERSONNEL. (NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.)

********** REACTIVITY DATA **********

STABLE OR UNSTABLE: STABLE
CONDITIONS TO AVOID: STABLE UNDER NORMAL CONDITIONS.
INCOMPATIBILITY:
THIS PRODUCT WILL REACT WITH ANY MATERIALS CONTAINING ACTIVE HYDROGENS SUCH AS WATER, ALCOHOL, AMMONIA, AMINES, ALKALIES AND ACIDS. THE REACTION WITH WATER IS VERY SLOW UNDER 50 C BUT IS ACCELERATED AT A HIGHER TEMPERATURE & IN THE PRESENCE OF ALKALIE, ERTIARY AMINE AND METAL COMPOUNDS. SOME REACTIONS CAN BE VIOLENT.
HAZARDOUS DECOMPOSITION PRODUCTS:
COMBUSTION PRODUCTS ARE CARBON DIOXIDE, CARBON MONOXIDE, NITROGEN OXIDES, TRACES OF HYDROGEN CYANIDE.
HAZARDOUS POLYMERIZATION: MAY OCCUR
CONDITIONS TO AVOID:
HIGH TEMPERATURES AND THE PRESENCE OF ALKALIES, TERTIARY AMINES, AND MET COMPOUNDS WILL ACCELERATE POLYMERIZATION. POSSIBLE EVOLUTION OF CARBON DIOXIDE GAS MAY RUPTURE CLOSED CONTAINERS.

********** SPILL AND DISPOSAL PROCEDURES **********

SPILL PROCEDURES:
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: WEAR SKIN, EYE AND RESPIRATORY PROTECTION DURING CLEAN UP. MIX WITH AN ABSORBENT AND SHOVEL INTO WASTE CONTAINER. COVER CONTAINER, BUT DO NOT SEAL, AND REMOVE IT FROM THE WORK AREA. PREPARE A DECONTAMINATION SOLUTION OF 0.2-5% LIQUID DETERGENT AND 3-8% CONCENTRATED AMMONIUM HYDROXIDE IN WATER (5-10% SODIUM CARBONATE MAY BE SUBSTITUTED FOR THE AMMONIUM HYDROXIDE.) TREAT THE SPILL AREA WITH THIS SOLUTION, USING ABOUT 10 PARTS SOLUTION FOR EACH PART OF SPILL & ALLOW IT TO REACT FOR 10 MINS. CARBON DIOXIDE WILL BE EVOLVED, LEAVING INSOLUBLE POLYUREAS.
DISPOSAL PROCEDURES:
SLOWLY STIR THE ISOCYANATE WASTE INTO THE DECONTAMINATION SOLUTION ESCRIBED ABOVE, USING 10 PARTS OF THE SOLUTION FOR EACH PART OF ISOCYANATE. LET STAND FOR 48 HOURS ALLOWING THE EVOLVED CARBON DIOXIDE TO VENT AWAY. NEUTRALIZE THE WASTE. NEITHER THE SOLID

MATERIAL SAFETY DATA SHEET

(HENKEL #: UR-8225BH-S)

NOR THE LIQUID PORTION IS A HAZARDOUS WASTE UNDER RCRA,
40 CFR 261.

********** PROTECTIVE EQUIPMENT **********

VENTILATION: USE LOCAL EXHAUST TO KEEP EXPOSURES TO A MINIMUM.
RESPIRATORY PROTECTION:
BECAUSE OF THE LOW VAPOR PRESSURE, VENTILATION IS USUALLY SUFFICIENT TO KEEP VAPORS BELOW THE TLV AT ROOM TEMPERATURES. EXCEPTIONS ARE WHEN THE MATERIAL IS SPRAYED OR HEATED. IF NECESSARY, USE A MSHA NIOSH APPROVED POSITIVE PRESSURE SUPPLIED AIR RESPIRATOR WITH A FULL FACE PIECE. EMERGENCIES USE POSITIVE PRESSURE/SELF-CONTAINED BREATHING APPARATUS.
PROTECTIVE CLOTHING: GLOVES, APRON, ARM COVERS OR FULL BODY SUIT.
EYE PROTECTION:
EYE WASH STATION IN WORK AREA. CHEMICAL TIGHT GOGGLES; FULL FACESHIELD IN ADDITION IF SPLASHING IS POSSIBLE.

********** SPECIAL PRECAUTIONS **********

HANDLING & STORAGE PRECAUTIONS:
PREVENT SKIN AND EYE CONTACT. OBSERVE TLV LIMITATIONS. AVOID BREATHING VAPORS OR AEROSOLS. A SENSITIZED INDIVIDUAL SHOULD NOT BE EXPOSED TO THE PRODUCT WHICH CAUSED THE SENSITIZATION. STORE IN TIGHTLY SEALED CONTAINERS TO PROTECT FROM ATMOSPHERIC MOISTURE. STORE AT TEMPERATURE OF 60-100 F.
SPECIAL COMMENTS:
NONHAZARDOUS INGREDIENTS WITHHELD UNDER PA TRADE SECRET STATUS.

EPA SARA TITLE III HAZARD CLASS:
COMBUSTIBLE LIQUID
WATER REACTIVE

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF EPA SARA TITLE III SECTION 313 (40CFR372):

CHEMICAL	CAS NUMBER	WEIGHT PERCEN
DIPHENYLMETHANE-DIISOCYANATE (MDI)	101-68-8	N/A

THE INFORMATION SUPPLIED HEREIN RELATES TO THE PRODUCT NAMED AND IS BASED UPON INFORMATION HENKEL ADHESIVES BELIEVES TO BE ACCURATE. NO WARRANTY, EXPRESS OR IMPLIED, IS INTENDED. THIS INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATIO AND INTERPRETATION.

REPARED BY: JOHN CAIN DATE: 11/21/97

Material Safety Data Sheet

Date Revised: 1/4/1999
Date Printed: 2/4/1999

Foam Supplies, Inc.
4387 North Rider Trail
Earth City, MO 63045-1103

Emergency Phone Number
Day: 314-344-3330
Night: 314-344-3330

1. Chemical Product & Company Identification

Name: FoamNail® Part A
Class: Polyurethane Adhesive } Sealing Foam

2. Composition/Information on Ingredients

Polymethylene polyphenyl isocyanate	CAS# 009016-87-9	90-100% Not Regulate.
containing 4,4' Methylene bisphenyl isocyanate	CAS# 000101-68-8	42-45%
(see Regulatory Information Page)		

3. Hazards Identification

EMERGENCY OVERVIEW

Brown liquid. Harmful if inhaled. May cause allergic skin reaction. May cause allergic respiratory reaction. Toxic fumes are released in fire situations. Avoid temperature above 105F (41C). Toxic flammable gases and heat are released under decomposition conditions. Reacts slowly with water, releasing carbon dioxide, which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this process.

POTENTIAL HEALTH EFFECTS (See Section 2 for toxicological data.)

EYE: May cause moderate eye irritation. May cause very slight transient (temporary) corneal injury.
SKIN: Prolonged or repeated exposure may cause skin irritation. Skin contact may result in allergic skin reactions or respiratory sensitization but is not expected to result in absorption of amounts sufficient to cause other adverse effects. May stain skin.
INGESTION: Single dose oral toxicity is considered to be extremely low. No hazards anticipated from swallowing small amounts incidental to normal handling operations.
INHALATION: At room temperature, vapors are minimal due to low vapor pressure. However, certain operations may generate vapor or aerosol concentrations sufficient to cause irritation or other adverse effects. Such operations include those in which the material is heated, sprayed, or otherwise mechanically dispersed such as drumming, venting or pumping. Excessive exposure may cause irritation of the eyes, upper respiratory tract, and lungs. May cause respiratory sensitization in susceptible individuals. MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized. Symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Effects may be delayed. Impaired lung function (decreased ventilatory capacity) has been associated with overexposure to isocyanates.
CHRONIC EFFECTS:
SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Tissue injury in the upper respiratory tract and lung has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.
CANCER INFORMATION: Lung tumors have been observed in laboratory animals exposed to aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects.
TERATOLOGY (BIRTH DEFECTS): In laboratory animals, MDI/polymeric MDI did not produce birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

4. First Aid

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.
SKIN: Wash with soap and plenty of water (warm water is preferable if readily available).
INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
NOTE TO PHYSICIAN: May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants, and antitussives may be of help. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant respiratory distress. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES

FLASH POINT: >400°F, >204°C
METHOD USED: PMCC, ASTM D93
AUTOIGNITION TEMPERATURE: >1100 F 600 C

FLAMMABILITY LIMITS

LFL: Not determined
UFL: Not determined

HAZARDOUS COMBUSTION PRODUCTS: During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include but are not limited to: nitrogen oxides, isocyanates, hydrogen cyanide, carbon monoxide, and carbon dioxide.
OTHER FLAMMABILITY INFORMATION: Dense smoke is produced when product burns. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. Product reacts with water. Reaction may produce heat and/or gases. Container may rupture from gas generation in a fire situation. This reaction may be violent.
EXTINGUISHING MEDIA: Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream. May spread fire.
MEDIA TO BE AVOIDED: Do not use direct water stream.
FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Water is not recommended, but may be applied in large quantities as fine spray when other extinguishing agents are not available. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard.
PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant clothing with SCBA. This will not provide sufficient fire protection, consider fighting fire from a remote location. For protective equipment in post-fire or non-fire clean up situations, refer to the relevant sections.

6. Accidental Release Measures

(See Section 15 for Regulatory Information)

PROTECT PEOPLE: Avoid any contact. Barricade area. Clear non-emergency personnel from area. Keep upwind of spill. Ventilate area of leak or spill. The area must be evacuated and reentered by persons equipped for decontamination. Use appropriate safety equipment. For additional information, refer to "Exposure Controls/Personnel Protection", MSDS Section 8. See MSDS, Section 10, for information on stability and reactivity.

PROTECT THE ENVIRONMENT: Contain liquid to prevent contamination of soil, surface water or ground water.
CLEAN UP: Absorb with material such as: sawdust, vermiculite, dirt, sand, clay, cob grit, Millisorb (R). Avoid materials such as cement powder. Collect material in suitable and properly labeled open containers. Do not place in sealed container. Prolonged contact with water results in a chemical reaction which may result in rupture of the container. Place in: polylined fiber pacs, plactic drums, or properly labeled metal containers. Remove to a well ventilated area. Clean up floor areas. Attempt to neutralize by adding materials such as: 5% ammonia or 5% sodium (bi) carbonate solution; with 2 % detergent. If ammonia is used, use good ventilation to prevent vapor exposure. If you have any questions on how to neutralize call Foam Supplies, Inc.
Please refer to Disposal Information, MSDS Section 13. See Section 7 and 15 for more specific information.

7. Handling and Storage

HANDLING: Use only with adequate ventilation. Do not eat, drink, or smoke in working area.
Refer to Exposure Controls/Personal Protection, Section 8, of the MSDS.
STORAGE: See "Stability & Reactivity", Section 10, of the MSDS. Keep containers tightly closed when not in use. Protect from atmospheric moisture. Store in a dry place. Store between 75F-105F (24C-41C).

8. Exposure Controls/Personal Protection

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.
PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: Use chemical goggles.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on operation. Remove contaminated clothing immediately, wash skin with soap and water (warm water if available) and launder clothing before reuse.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved positive-pressure supplied-air respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure airline with auxiliary self-contained air supply.

EXPOSURE GUIDELINE (S):
Methylene bisphenyl isocyanate (MDI): ACGIH TLV is 0.005 ppm TWA and OSHA PEL is 0.02 ppm Ceiling.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

9. Physical and Chemical Properties

APPEARANCE/PHYSICAL STATE:	Brown liquid.
ODOR:	Slightly musty.
VAPOR PRESSURE:	<1 x 10 (-5) mmHg @ 25C
VAPOR DENSITY:	8.5 (air=1)
BOILING POINT:	410 °F, 210°C @ 5 mmHg
SOLUBILITY IN WATER:	Insoluble in water, reacts with evolution of CO2.
SPECIFIC GRAVITY:	1.24@ 20°C = 10.29 lb/gal (8.3 lb/gal x 1.24)
pH:	Not applicable.

10. Stability and Reactivity

CHEMICAL STABILITY: Stable under recommended storage conditions. See storage section.
CONDITIONS TO AVOID: Can react with itself at temperatures above 160C, 320F. Avoid temperatures above 105F, 41C. Avoid temperatures below 75F, 24C. Product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure buildup can be rapid. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide, which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid unintended contact with polyols. The reaction of polyols and isocyanates generate heat. See Hazardous Polymerization Section. Avoid contact with acids, water, alcohols, amines, ammonia, bases, moist air, and strong oxidizers. Avoid contact with metals such as aluminum, zinc, brass, copper, galvanized metals. Reaction with water will generate carbon dioxide. Generation of a gas can cause pressure buildup in closed systems.
HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.
HAZARD POLYMERIZATION: Can occur. Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by tertiary amines.

11. Toxicological Information

(See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1)

ACUTE

SKIN:	The LD50 for skin absorption in rabbits is > 9400 mg/kg.
INGESTION:	The oral LD50 for rats is > 10,000 mg/kg.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Mutagenicity data on MDI are inconclusive. MDI was weakly positive in some in-vitro (test tube) studies; other in-vitro studies were negative. A mutagenicity study in animals was negative.

12. Ecological Information

(For detailed ECOLOGICAL data, write or call the address or non-emergency number shown in Section 1)

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: Based on information for MDI and polymeric MDI. In the aquatic or terrestrial environment, movement is expected to be limited by its reactivity with water forming predominantly insoluble polymers.
DEGRADATION & PERSISTENCE: Based on information for MDI and polymer MDI. In the environment, material reacts with water forming insoluble polymers (polyurea crusts) which appear to be stable.
ECOTOXICITY: Based on information for MDI and polymeric MDI. Material is practically non-toxic to aquatic organisms on an acute basis (LC50 greater than 100 mg/L in most sensitive species).

13. Disposal Considerations

(See Section 15 for Regulatory Information)

DISPOSAL: *DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.* All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. FOAM SUPPLIES, INC. HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information On Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

For additional information, refer to:

- Handling & Storage Information, MSDS Section 7.
- Stability & Reactivity Information, MSDS Section 10.
- Regulatory Information, MSDS Section 15.

As a service to its customers, Foam Supplies, Inc. can provide lists of companies which recycle, reprocess or manage chemicals or plastics, and companies that manage used drums. Telephone Foam Supplies, Inc. at 800-325-4875 for further details.

14. Transport Information

DOT CLASSIFICATION/DESCRIPTION

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or your FSI representative.

CANADIAN TDG INFORMATION

For TDG regulatory information, if required, consult transportation regulations, product shipping papers, or your FSI representative.

15. Regulatory Information

(Not meant to be all-inclusive—selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. Regulations

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
METHYLENE BIS(PHENYLISOCYANATE) (MDI)	000101-68-8	42-45 %
POLYMERIC DIPHENYLMETHANE DIISOCYANATE	009016-87-9	95-100 % NR

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

The CAS number(s) for TSCA is (are):
CAS # 009016-87-9
CAS # 000101-68-8

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
METHYLENE BIS(PHENYLISOCYANATE) (MDI)	000101-68-8	NJ3 PA1 PA3 NJ2

NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%).
NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present as greater than or equal to 1.0%).

PAJ=Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD:
This product is a "HAZARD CHEMICAL" as defined by the OSHA HAZARD Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):
This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:
Category:

CHEMICAL NAME	CAS NUMBER	% in PRODUCT
Methylene bisphenyl isocyanate	000101-68-8	42-45

CANADIAN REGULATIONS

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

D2A - respiratory tract sensitizer
D2B - eye or skin irritant
D2B - skin sensitizer

Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

- - - - - - -

CPR STATEMENT: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and MSDS contains all the information required by the CPR.

- - - - - - -

HAZARDOUS PRODUCTS ACT INFORMATION: This product contains the following ingredients which are Controlled Products and/or on the Ingredient Disclosure List (Canadian HPA section 13 and 14):

COMPONENTS:	CAS #	AMOUNT (%w/w)
METHYLENE BIS(phenylisocyanate) (MBI)	000101-68-8	42-45%
POLYMERIC DIPHENYLMETHANE DIISOCYANATE	009016-87-9	90-100%

16. Other Information

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health	3
Flammability	1
Reactivity	1

OTHER INFORMATION: The reaction of polyols and isocyanates generate heat. Contact of the reacting materials with skin or eyes can cause severe burns and may be difficult to remove from the affected areas. In addition, such contact increases the risk of isocyanate vapors.

****

The information herein is given in good faith, but no warranty, express or implied, is made. Consult Foam Supplies, Inc. for further information.

MB:FoamNail Part A
FoamNail is a Registered trademark of Foam Supplies, Inc.
1/99

FS emiss

foam supplies, inc.

4387 North Rider Trail
Earth City, Missouri 63045-1103
Tel: 314-344-3330
1-800-325-4875
Fax: 314-344-3331

MATERIAL SAFETY DATA SHEET

For chemicals, coatings, and related materials

Date Revised: 5/19/1999
Date Printed: 5/19/1999

Foam Supplies, Inc.
4387 North Rider Trail
Earth City, MO 63045

Emergency Phone Number
Day: 314-344-3330
Night: 314-344-3330

1. Product

Number: Foam Nail® Part B
Class: Polyurethane Adhesive } ceiling panels

H.M.I.S. Hazard Codes
Health: 1 Slight
Flammability: 1 Slight
Reactivity: 0 Minimal
Personal Protective Equipment: X

2. Hazardous Ingredients

Ingredient / Material Description	Percent By Weight	C.A.S. Registry No.	LEL %	Vapor Pressure PSIA @ 25°C
Amine Catalyst	0-2	Proprietary	N/A	N/A
Oxyethylated Aliphatic Amine	0-15	62476-52-2	N/A	N/A
Formaldehyde, Polymer with nonylphenol, reaction products with Diethanolamine and Propylene Oxide.	20-60	68610-97-9	N/A	Very low

} none are regulated as TAP's (IDAPA 58.01.01.585; IDAPA 58.01.01.586)

*Remaining ingredients are non hazardous proprietary blend of polyols.

3. Health Hazard Data

Effects of Overexposure: Threshold Limit Values: See Section 11

Liquid contact may cause eye irritation. Vapors may be mildly irritating to eyes.
Repeated or prolonged skin contact may cause irritation and drying.

VOC's → 1999 usage = 30,861 lb

$\rho = (1.06)(8.3314\ lb/gal) = 8.8314\ lb/gal$

$\therefore gal/yr = \frac{30,861\ lb/yr}{8.8314\ lb/gal} = 3495\ gal/yr$

4. First Aid

Emergency and First Aid Procedures:

Flush eyes with large amounts of water for at least 15 minutes.
Get medical attention.
Wash skin thoroughly with large amounts of soap and water.
Consult a physician if irritation develops or persists.
Remove contaminated clothing and wash before re-use.
If affected by vapors, remove patient to fresh air and get medical attention. Give oxygen or artificial respiration if necessary. Do not give stimulants. Ephinephrine and similar drugs may adversely affect the heart due to a possible risk of eliciting cardiac dysrythmias.
If swallowed, do not induce vomiting. Get medical attention immediately.
The hazard of aspirating material into the lungs is greater than the hazard associated with allowing material to progress through the intestinal tract.

Carcinogenic According to NTP, IARC, or OSHA

This product does not contain ingredients listed by NTP, IARC, or OSHA.

3495 gal/yr * 1.2 = 4194 gal/yr

5. Fire and Explosion Hazard Data

Flash Point: > 300.0 °F (Method Used) Pensky-Martens

Explosive Limits: LEL UEL (%V in air)

ENCLOSURE # 7

Flammability Classification:

OSHA: Combustible Liquid - Class IIIB

DOT: Not regulated for flammability

Extinguishing Media:

Foam, alcohol foam, carbon dioxide, dry chemical, water fog.

Special Fire Fighting Procedures:

Fire fighters should wear a self-contained breathing apparatus with full facepiece operated in a positive pressure mode.

Fire fighters should wear full protective clothing to guard against exposure to toxic and irritating fumes.

Spray containers exposed to fire and heat with water to keep cool.

Unusual Fire and Explosion Hazards:

Do not weld or use a cutting torch on or near drums, even if empty.

Empty drums contain residual material which may decompose to emit toxic or irritating fumes if burned.

6. Spill or Leak Procedures

Steps for Material Spillage:

Properly protected personnel should contain the spill & soak it up with absorbent material. Shovel the absorbed material into containers for disposal.

Waste Disposal Methods:

Dispose of according to federal, state, and local regulations.

Empty containers retain product residue and are subject to all of the handling instructions on this sheet.

7. Special Precautions

Handling and Storage Precautions:

Avoid unnecessary skin contact with this product.

Avoid breathing vapors.

Provide adequate ventilation during use.

Wear an appropriate respirator during and after use unless airborne concentrations are known to be below the TLV.

Other Precautions:

Store in cool, dry location.

Keep containers tightly sealed and upright when not in use.

8. Special Protection Information

Respiratory Protection:

Under normal conditions, respiratory protection is not necessary. However, if the TLV for the solvent is exceeded, use a NIOSH/MSHA approved organic vapors mask. If the TLV is greatly exceeded, or in confined or poorly ventilated areas, use a positive pressure, air supplied or self contained breathing apparatus.

Ventilation:

Mechanical or local exhaust is required to keep concentrations below the TLV and/or to prevent any accumulation of vapors.

Vapors are heavier than air and will collect in low areas such as pits or tanks, reducing the oxygen available for breathing. NEVER ENTER AN AREA OF UNKNOWN CONCENTRATION WITHOUT FULL RESPIRATORY PROTECTION!

Protective Gloves:

Chemical resistant gloves.

Eye protection:

Chemical safety glasses or splash goggles to prevent eye contact.

Do not wear contact lenses.

Other Protective Equipment:

If needed to prevent unnecessary skin contact.

Primary Routes of Entry:

Skin contact

Inhalation

9. Physical Data

Boiling Range: Not determined
Freezing Point: N/A
Vapor Pressure: Not determined
Vapor Density: Not determined
Specific Gravity: 1.06 at 25 °C
H_2O Soluble: (.1%- 1.0%)
Evaporation Rate: Faster
(relative to n-butyl acetate)
% Volatile by Volume: <6%
Appearance and Odor: Clear to dark amber liquid; faint ethereal odor

(8.83 lb/gal)(6/100) = 0.53 lb/gal

(4194 gal/yr)(0.53 lb VOC/gal)(1yr/8760 hr) = 0.25 lb/hr

10. Reactivity Data

Stability: Stable
Stability Conditions to Avoid:
Open flames, welding arcs, or other high temperature sources can induce thermal decomposition.
Incompatibility (Materials to Avoid Contact with):
Avoid prolonged contact with, or storage in, aluminum, other alkali or alkaline earth metals such as powdered Zn, Mg, Na, K, Ca, Be, or their alloys.
Hazardous Decomposition Products:
CO, CO^2
Hazardous Polymerization: Will not occur
Polymerization Conditions to Avoid: None

(0.25 lb/hr)(8760/2000) = 1.10 T/yr

11. Toxicological Information

Ingredient / Material Description	PEL (mg/m3)	TLV (twa) (mg/m3)	(ppm)	LD50(mg/kg) (rat) ORAL	(rbt) DERMAL	LC50 (ppm) (rat) INHAL
Amine Catalyst	1-3 ppm	N/A		425mg/kg		
Oxyethylated Aliphatic Amine	N/A	N/A	N/A	>5g/kg	>2g/kg	>200mg/l
Formaldehyde, Polymer with nonylphenol, reaction products with Diethanolamine and Propylene Oxide.	N/A	N/A	N/A	2.12g/kg	>16g/kg	N/D

****

12. Ecological Information

Not Available

13. Disposal Considerations (See Section 15 for Regulatory Information)

Disposal: DO NOT PUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations.

Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Foam Supplies Inc. HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCTS AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information on Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destructive device.

14. Transport Information

DOT CLASSIFICATION/DESCRIPTION

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or your FSI representative.

CANADIAN TDG INFORMATION

For TDG regulatory information, if required, consult transportation regulations, product shipping papers, or your FSI representative.

15. Regulatory Information

(Not meant to be all inclusive—selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD sheet for health and safety information.

U. S. Regulations

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR.

Part 372:

CHEMICAL NAME	CAS Number	CONCENTRATION

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard

A delayed health hazard

TSCA (Toxic Substances Control Act) Regulations, 40 CFR 710:

All ingredients are on the TSCA Section 8 (b) Inventory.

CANADIAN REGULATIONS

The Workplace Hazardous Materials Information System (W.H.M.I.S.) Classifications for this product is:

D1B

D2A

D2B

16. Other information

The reaction of polyols and isocyantes generate heat. Contact of the reaction materials with skin or eyes can cause severe burns and may be difficult to remove from the affected areas. Immediately wash the affected areas with plenty of water and seek medical assistance.

While the information and recommendations set forth herein are believed to be accurate as of the date hereof, Foam Supplies, Inc. makes no warranty with respect thereto and disclaims any liability from reliance thereon.

MB:FoamNail
5/99

FOAM SUPPLIES, INC.

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
TOM SPURLING	PAULA EGENRITZ
FAX NUMBER:	DATE:
208-549-0060	MARCH 31, 2000
COMPANY:	TOTAL NO. OF PAGES INCLUDING COVER:
CHAMPION HOMES	1
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
208-549-1410 EXT 236	
RE:	YOUR REFERENCE NUMBER:
1999 POUNDS PURCHASED – REDMAN/WEISER	

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Redman Homes, 1425 Sunny Side Road, Weiser, ID 83672

A-side pounds = 34,682 B-side pounds = 30,861

Redman Homes, 1442 Sunny Side Road, Weiser, ID 83672 (champion)

A-side pounds = 15,764 B-side pounds = 14,194

4387 NORTH RIDER TRAIL · EARTH CITY, MO 63045
PHONE: 314/344-3330 · FAX: 314/344-3331

ENCLOSURE # 5

TOTAL P.01

In regards to calculating MDI emissions for your foaming process the following is a possible method.

I have taken the calculations and assumptions from the MDI Emissions Reporting Guidelines published by the society of Plastics Industry, Inc 1992.

This letter comes under the same disclaimer as the NOTE TO READERS page enclosed.

I am using example six on page 4-19 to estimate your emissions as it most closely imitates your production process.

The assumptions made in this example will be the same as theirs except for:

3. I have estimated the average surface area of foam on an average ceiling to be 58.5ft^2 which would be 5.4M^2. I did this by assuming an average bead size of 3/4 " x 1$^{1/8"}$ would give a third side width of .1125ft. I multiplied this times an average bead length for a 44ft ceiling of 416ft. I then multiplied this by a factor of 1.25 to accommodate for the rounded surface.
4. A 15-second or tack free time.
5. A production rate of 10 ceilings a day

Substituting these numbers for theirs in the calculations:

Calculation 1. Would be the same 1.8×10^{-6} atmospheres

Calculation 2. I did in assumption (3) =5.4M^2/ceiling.

Calculation 3. W=4.32×10^{-4} grams/sec

Calculation 4. MDI per ceiling
=1.4×10^{-5} lbs./ceiling

Calculation 5. TOTAL MDI
=1.4×10^{-5} lbs./ceiling x $\frac{10\text{ceilings}}{\text{day}}$ x $\frac{250\text{days}}{\text{year}}$
=. 035 lbs./year

As you can see from this sample even if my assumptions are off by a factor of 10 you would still be considerably less than one pound per year.

If you have any questions please do not hesitate to call.

Best regards,

Mark S. Schulte

MS/ks

PTE:

$(0.035\,lb/yr)(365/250) = 0.051\,lb/yr$

$(0.051\,lb/yr)(1\,yr/8760\,hr) = 5.8E\text{-}6\,lb/hr$

Note to Readers:

This document reviews the requirements for reporting releases of listed chemicals of interest to members of the polyurethane industry under the provisions of Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA). Its principal purpose is to outline suggested techniques for estimating emissions of 4,4'-methylene diphenyl diisocyanate (MDI) for completing the Environmental Protection Agency's (EPA) Form R. The methodologies used to estimate releases have been developed using standard techniques, but may not be suitable for estimating releases of other chemicals. The information provided in this document is offered in good faith and believed to be reliable, but is made WITHOUT WARRANTY, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER. This document is not intended to provide emissions data for any particular product or process. Scenarios have been selected which are thought to be representative of situations where releases may occur. Other scenarios not reflected in this document may involve releases as well. It is the responsibility of all manufacturers, processors or users of any listed chemical to know and understand the reporting obligations, and to provide accurate information in accordance with the provisions of the law. Consult your own legal and technical advisors for specific advice applicable to your own facility.

Engineering Calculation

Release estimates derived from engineering calculations are based on credible application of physical/chemical properties and relationships, and knowledge of a particular process. Engineering calculations are used extensively in the remainder of this workbook as the basis for estimating releases of MDI from polyurethane activities. For example, in estimating MDI releases from closed mold-type processes, knowledge about the relationship between vapor pressure, temperature, and volume is used to calculate the maximum amount of MDI that can be released from any single mold filling activity. Multiplying the amount of MDI released or emitted per mold filling by the number of mold fillings that occur in a given year provides a reasonable estimate of annual MDI releases for that operation. In many of the examples in which releases will be small we have used simplified estimation techniques. For example, in virtually all calculations that involve volatilization of MDI, we have assumed that MDI comprises 100% of any mixture from which volatilization occurs. This is typically not true. The degree to which substances in a mixture are volatilized depends upon the ratio of mixture components and vapor pressures of each of the mixture components. The partial pressure (a measure of volatilization) of any one component in the mixture will be less than the vapor pressure of that pure component at the same temperature and pressure. Accordingly, release estimates based on that assumption will be conservatively high.

General equations and assumptions are used repeatedly throughout this workbook. These assumptions are intended to provide conservative or reasonable worst case assumptions in estimating MDI releases.[5] Examples in the workbook were selected to reflect major scenarios where MDI releases are likely to occur. There may be release scenarios particular to your facility that are not described here.

---

[5] These general approaches may be suitable for estimating releases of other relatively non-volatile chemicals in similar applications. You will need chemical specific vapor pressure information for other chemicals. These approaches are not suitable for solvents or other volatile substances such as blowing agents or low molecular weight amine catalysts.

(2) Calculate the number of cubic feet of cavity space filled based on the density of foam and the amount of foam feedstocks used.

$$\text{Total cavity volume} = \frac{\text{quantity of foam feedstocks used (lbs/yr)}}{\text{average foam density (lbs/ft}^3\text{)}}$$

$$= \frac{(20{,}000{,}000 \text{ lbs/yr})}{2.0 \text{ lbs/ft}^3}$$

$$= 10{,}000{,}000 \text{ ft}^3\text{/yr}$$

(3) Calculate the total MDI emissions per year.

$$\text{Total MDI released} = (\text{SVC of MDI (lbs/ft}^3\text{)} \times \text{(total cavity volume (ft}^3\text{/yr)}$$

$$= (1.2 \times 10^{-4} \text{ lbs/ft}^3)(10{,}000{,}000 \text{ ft}^3\text{/yr})$$

$$= 12 \text{ lbs/yr}$$

Open Processes

The open process estimation approaches can be used for applications in which MDI based products are introduced into a mold or cavity, but are cured with a significant fraction of the MDI containing product exposed to the atmosphere, or in which the MDI-based product is layered, sprayed or coated onto a surface. Examples of open process applications are provided below.

- Slabstock/Bunstock
- Laminate Boardstock
- Metal Skin Panels
- Carpet Backing/Flooring
- Rebond Production
- Coatings

- Spray Foaming
- Adhesives
- Sealants

The basic assumption used in calculating MDI releases from "open" processes is that MDI vapor will volatilize from all exposed surfaces of a curing foam, adhesive, coating or other MDI-containing product. Evaporative releases from open processes (or spills) depend upon many factors including: (1) the volatility of the material, (2) the surface area from which evaporation occurs, (3) the temperature of the curing product, (4) the airflow rate, and (5) the duration of the activity.

A fairly simple model that accounts for all of these factors is provided by the following equation. (See Reference 4.)

$$W = 25.4 \left(\frac{P_T^{\circ} M_T}{T}\right) \mu^{0.78} A$$

Where W = evaporation rate in grams/second
P_T° = liquid vapor pressure in atmospheres
M_T = average molecular weight (= 250 for MDI)
T = temperature in Kelvin
μ = airflow rate in meters (m)/second
A = area exposed in M^2

Example 6: Slabstock/bunstock manufacture (batch process)

Assume 1) The maximum temperature in the MDI foam at the "tack free" or "string" time[8] during the curing process is 160°F (70°C, 343K) (this is a reasonable worst case assumption if operation specific data is not available),

[8] As discussed in Example 4, using the maximum exotherm temperature instead of the "tack free" time temperature will result in an overestimate of MDI releases.

2) a ventilation flow rate of 3 meters (M)/second,

3) a foam block size of 2 x 1 x 1M,

4) a 2 minute "tack free" time during which appreciable unreacted MDI may remain in the foam, and

5) a production rate of 120 blocks per day.

(1) Determine P_T^* for MDI at the tack free time temperature.

Based on the VP/T chart on page 6-1, the vapor pressure of MDI at 70°C is 1.4×10^{-3} mm mercury (mm).

$\frac{1.4 \times 10^{-3} \text{ mm}}{760 \text{ mm}} = 1.8 \times 10^{-6}$ atmospheres

(2) Determine A.

The exposed area of foam from which MDI can volatilize is the top of the rising bun. If the bun is relatively flat, this surface area will be the width times the length of the mold. If the surface becomes rounded as the foam expands, a larger surface area will result. A factor of 1.25 times the flat surface area will adequately account for a rounded rising surface.

Area = (2M)(1M)(1.25 "rise" factor)

= 2.5 M^2

(3) . Determine W.

$$W = 25.4 \left(\frac{1.8 \times 10^{-4}}{343}\right)(250)\,(3)^{0.78}\,(2.5)$$

$$= 2.0 \times 10^{-4} \text{ grams/sec.}$$

(4) Determine MDI released per mold.

$$\text{MDI per mold} = \frac{(2.0 \times 10^{-4} \text{ g})(60 \text{ sec})(2 \text{ min})(1 \text{ lb})}{\text{sec} \quad 1 \text{ min} \quad 1 \text{ mold} \quad 454 \text{ g}}$$

$$= 5.3 \times 10^{-5} \text{ lb/mold}$$

(5) Determine total MDI released.

$$\text{Total MDI} = \frac{(5.2 \times 10^{-5} \text{ lb})(120 \text{ mold})(250 \text{ days})}{\text{mold} \quad \text{day} \quad \text{yr}}$$

$$= 1.6 \text{ lbs}$$

Example 7: Laminate boardstock or slabstock (continuous process)

Laminate boardstock, slabstock and metal skin panel manufacture can be treated as open processes by assuming that MDI will migrate from all exposed surfaces. In some applications, such as in the manufacture of metal skin panels only the sides of the rising foam will be exposed. In other applications, both the top and sides may be exposed. Materials used as top facers in laminate production may be permeable to MDI vapor, therefore, if you do not have information that would lead you to believe that the facer material used at your facility is impermeable to MDI, it is recommended that you treat the top surface

APPENDIX D

AIRS Information

Champion Home Builders
Weiser

T200072
September 2000

ABBREVIATED AIRS DATA ENTRY SHEET

Name of Facility: Champion Home Builders

AIRS/Permit #: 087-00008

Permit Issue Date: 9/00

*Source/Emissions Unit Name (25 spcs) (Please use name as indicated in permit)	SCC # (8 digit #)	Air Program (SIP/NESHAP/ NSPS/PSD)
*Construction: Contractors	31100199	SIP

RETURN TO PAT RAYNE

AIRS-PT.LST (3/99)

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

FACILITY NAME: Champion Home Builders, Wieser _

AIRS NUMBER: 087-00008 **DATE:** June 11, 2001

Air Program Description	SIP	PSD	NESHAP	NSPS	MACT	TITLE V	AREA CLASSIFICATION 1)Attainment, 2)Unclassifiable 3)Nonattainment
SO_2	B					B	2
NOx	B					B	2
CO	B					B	2
PM-10	B					B	2
PT (Particulate)	B					B	2
VOC	B					B	2
THAP (Total HAPs)	B					B	2
Other (Specify Below)							
(Add additional lines if necessary.)							

ABBREVIATED AIRS DATA ENTRY SHEET

Facility Name	Champion Home Builders, Wieser
AIRS Number	087-00008
Date of Permit Issuance	December 19, 2000

Source Description	SCC Number	Air Program SIP, PSD, NSPS, NESHAP
cabinet shop/mill	30703099	SIP